FIG. 1 (a)

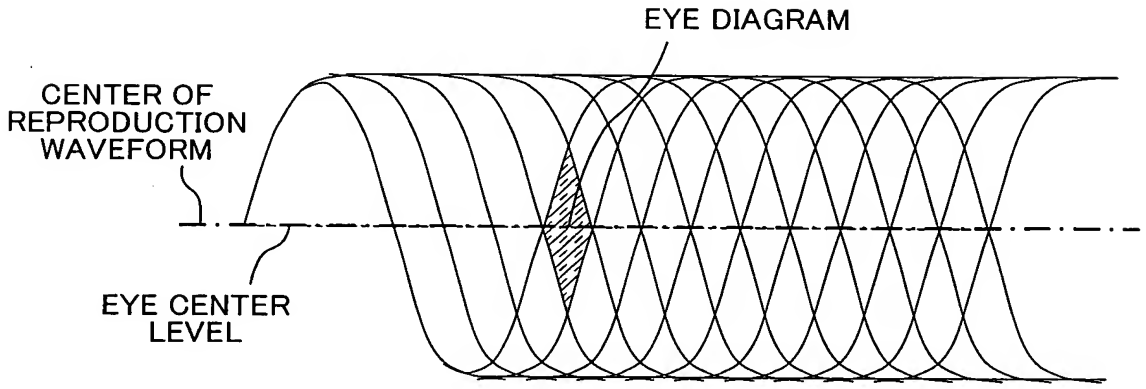

ASYMMETRY ABSENT
EYE DIAGRAM
CENTER OF REPRODUCTION WAVEFORM
EYE CENTER LEVEL

FIG. 1 (b)

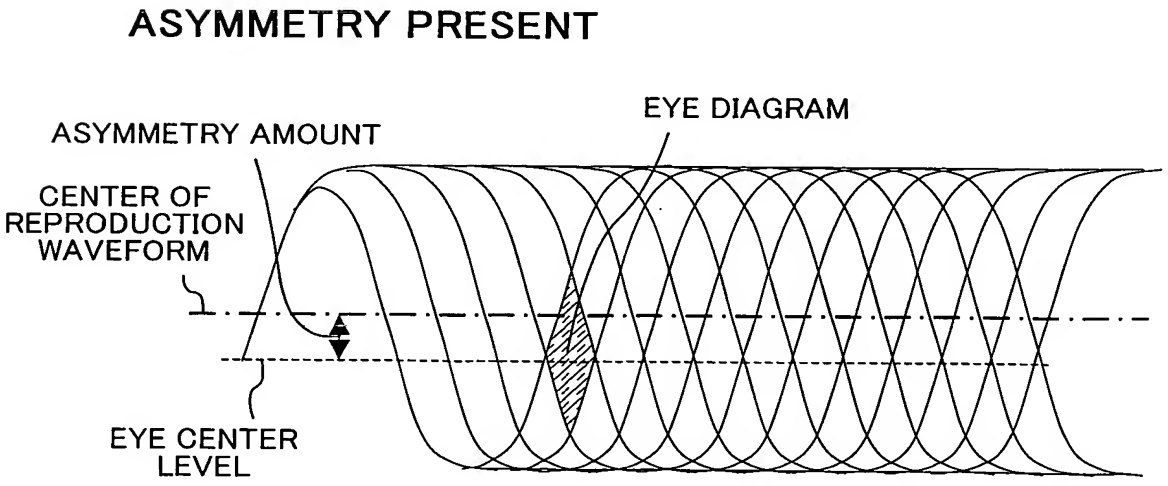

ASYMMETRY PRESENT
EYE DIAGRAM
ASYMMETRY AMOUNT
CENTER OF REPRODUCTION WAVEFORM
EYE CENTER LEVEL

FIG. 2

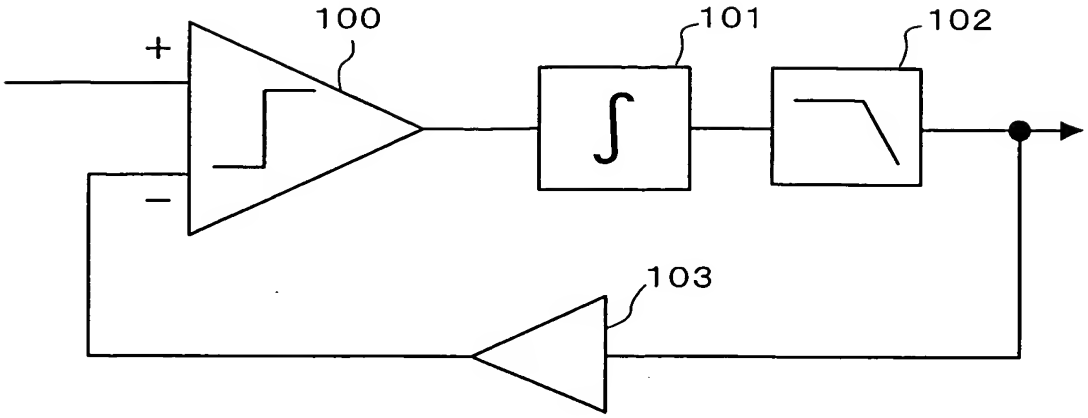

100
101
102
+
−
∫
103

FIG. 3

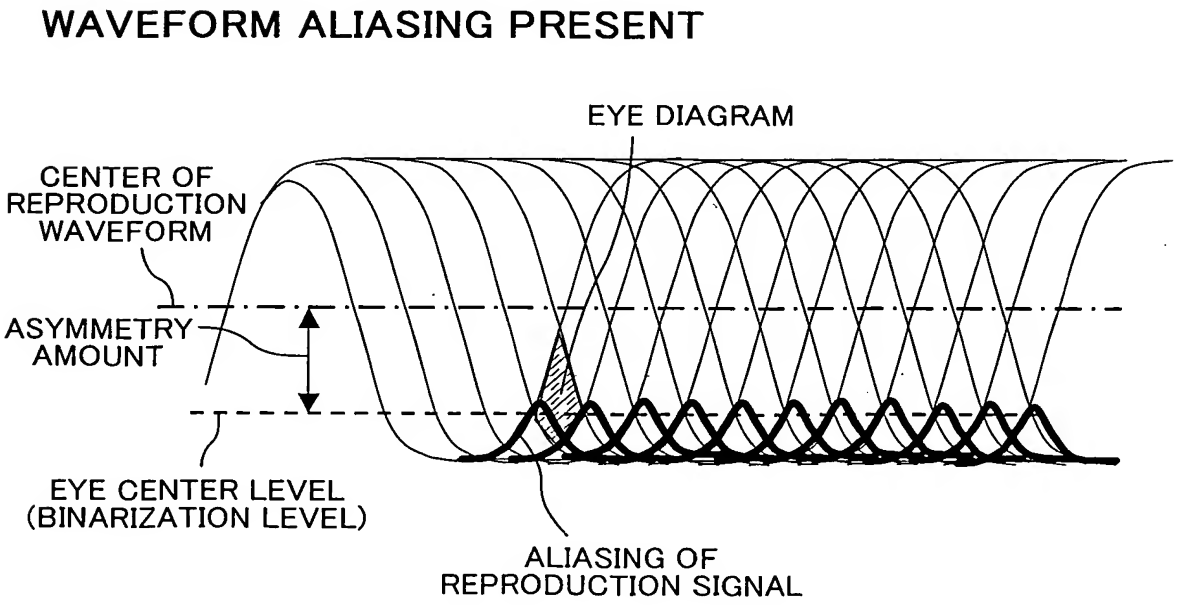

WAVEFORM ALIASING PRESENT
EYE DIAGRAM
CENTER OF REPRODUCTION WAVEFORM
ASYMMETRY AMOUNT
EYE CENTER LEVEL (BINARIZATION LEVEL)
ALIASING OF REPRODUCTION SIGNAL

FIG. 4

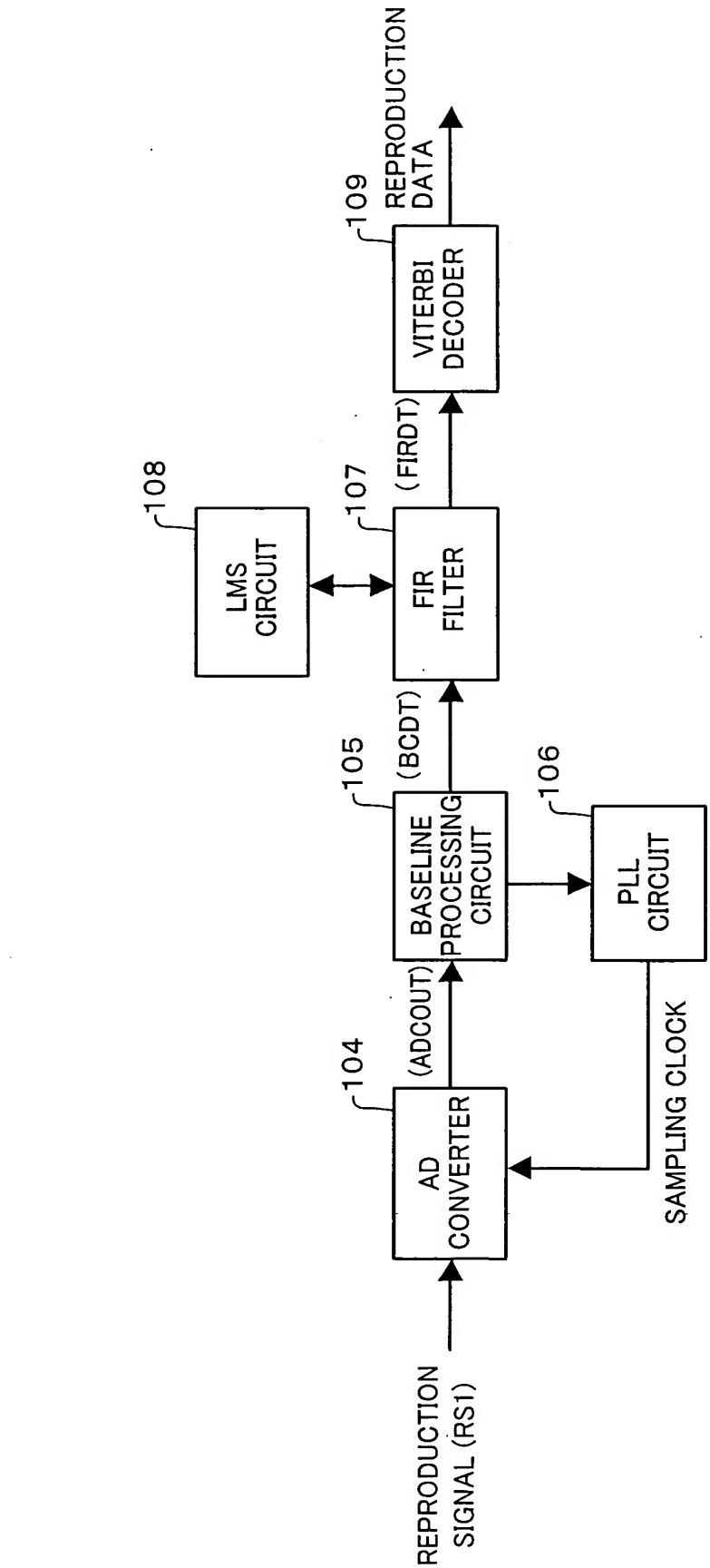
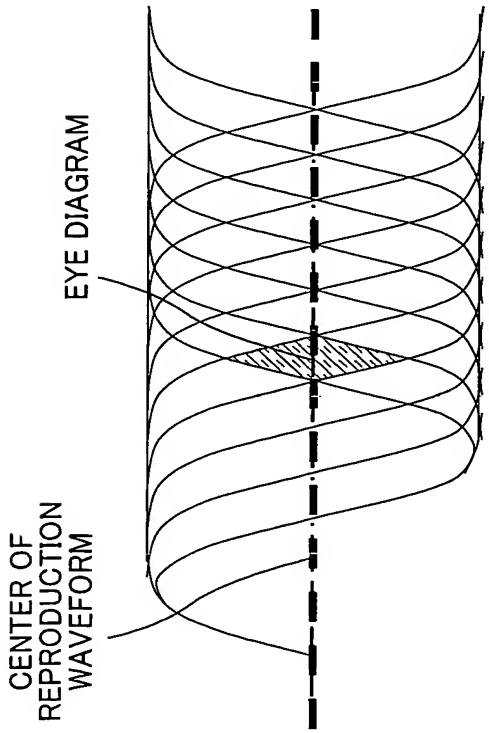
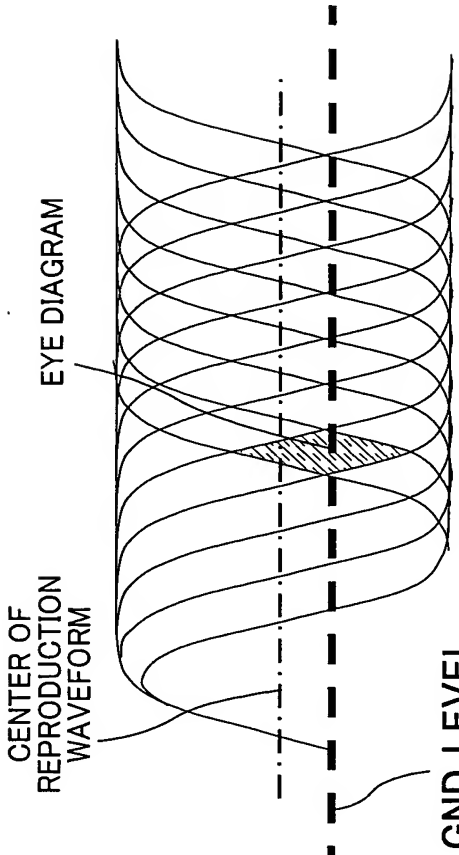

REPRODUCTION SIGNAL (RS1)
AD CONVERTER
104
(ADCOUT)
BASELINE PROCESSING CIRCUIT
105
(BCDT)
PLL CIRCUIT
106
SAMPLING CLOCK
FIR FILTER
107
(FIRDT)
LMS CIRCUIT
108
VITERBI DECODER
109
REPRODUCTION DATA

FIG. 5(a)



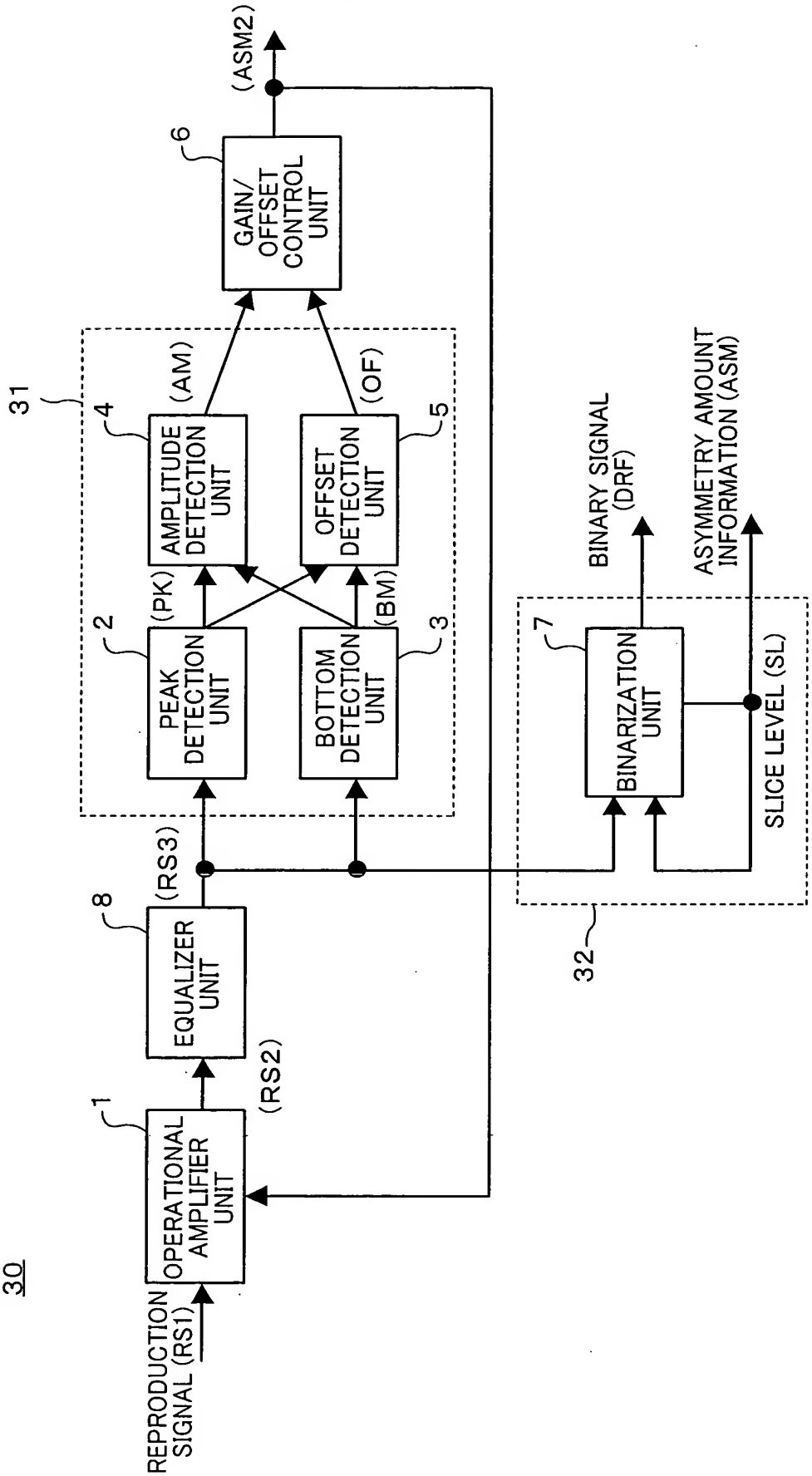
ASYMMETRY ABSENT

FIG. 5(b)



ASYMMETRY PRESENT

FIG. 6


30
REPRODUCTION SIGNAL (RS1)
OPERATIONAL AMPLIFIER UNIT
1
(RS2)
EQUALIZER UNIT
8
(RS3)
31
PEAK DETECTION UNIT
2
(PK)
BOTTOM DETECTION UNIT
3
(BM)
AMPLITUDE DETECTION UNIT
4
(AM)
OFFSET DETECTION UNIT
5
(OF)
GAIN/ OFFSET CONTROL UNIT
6
(ASM2)
32
BINARIZATION UNIT
7
BINARY SIGNAL (DRF)
ASYMMETRY AMOUNT INFORMATION (ASM)
SLICE LEVEL (SL)

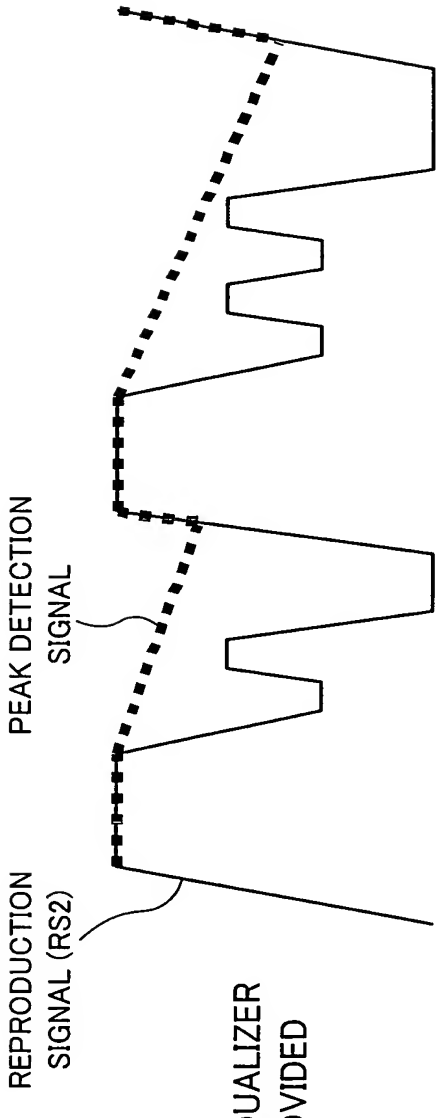

PEAK DETECTION SIGNAL
REPRODUCTION SIGNAL (RS2)
NO EQUALIZER PROVIDED

FIG. 7 (a)

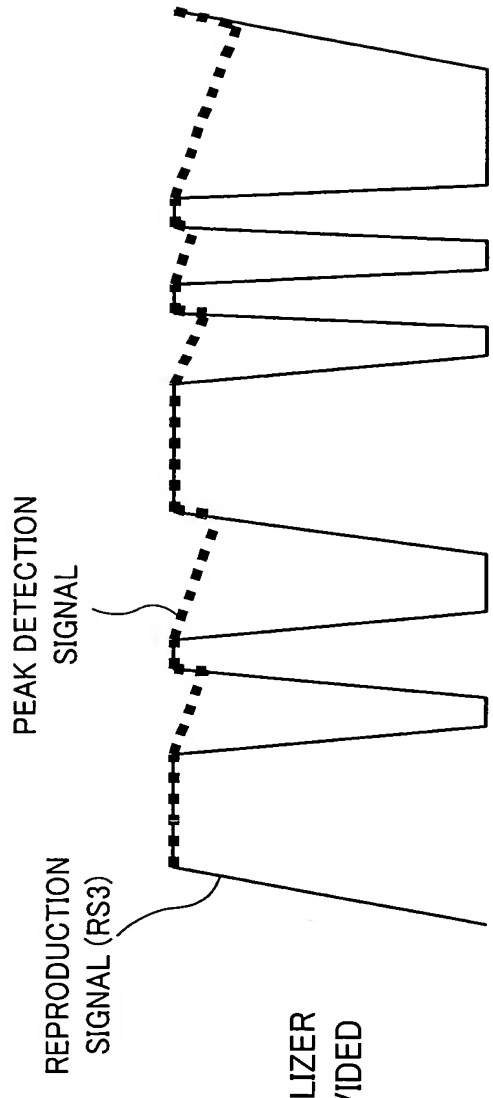

PEAK DETECTION SIGNAL
REPRODUCTION SIGNAL (RS3)
EQUALIZER PROVIDED

FIG. 7 (b)

FIG. 8(a)

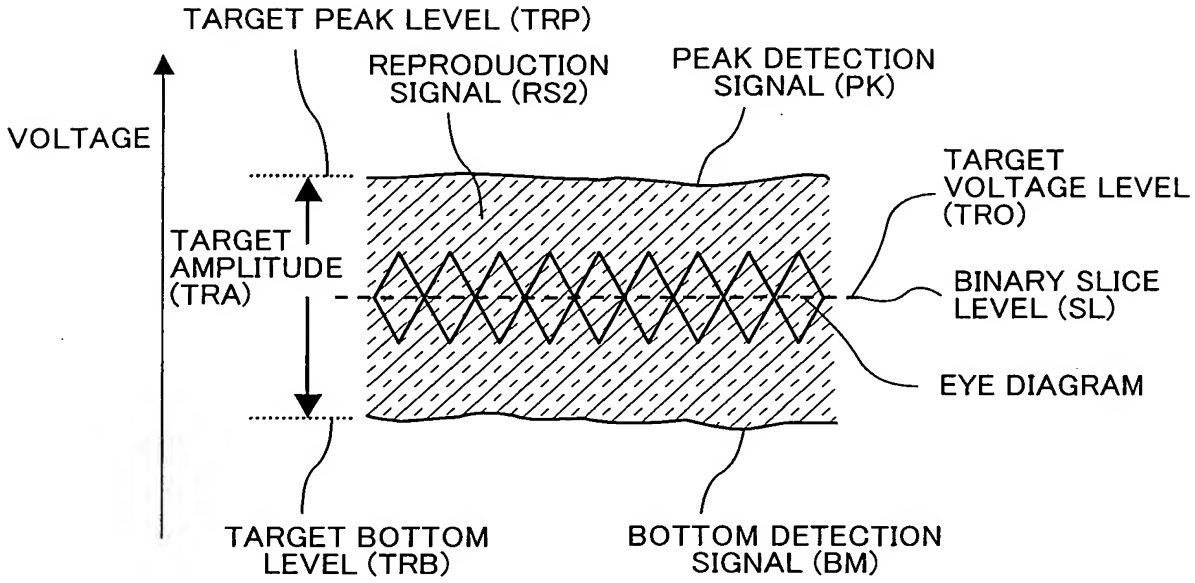

TARGET PEAK LEVEL (TRP)
REPRODUCTION SIGNAL (RS2)
PEAK DETECTION SIGNAL (PK)
VOLTAGE
TARGET VOLTAGE LEVEL (TRO)
TARGET AMPLITUDE (TRA)
BINARY SLICE LEVEL (SL)
EYE DIAGRAM
TARGET BOTTOM LEVEL (TRB)
BOTTOM DETECTION SIGNAL (BM)

FIG. 8(b)

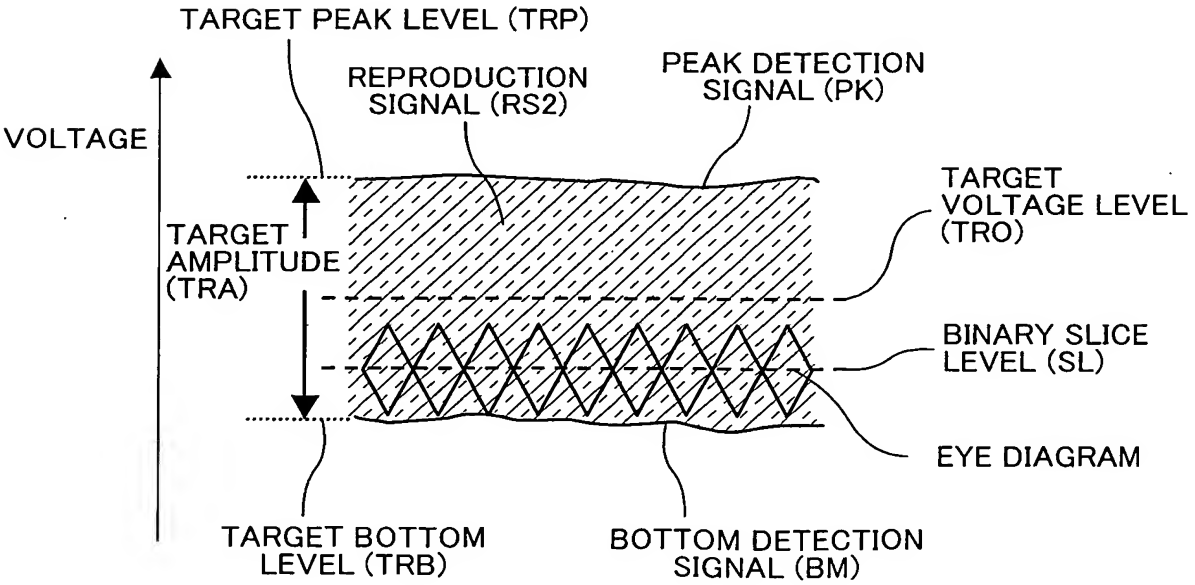

TARGET PEAK LEVEL (TRP)
REPRODUCTION SIGNAL (RS2)
PEAK DETECTION SIGNAL (PK)
VOLTAGE
TARGET VOLTAGE LEVEL (TRO)
TARGET AMPLITUDE (TRA)
BINARY SLICE LEVEL (SL)
EYE DIAGRAM
TARGET BOTTOM LEVEL (TRB)
BOTTOM DETECTION SIGNAL (BM)

FIG. 9(a)

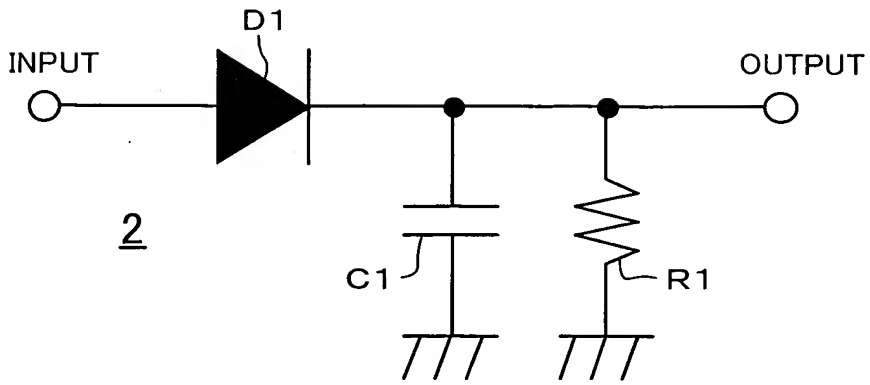


FIG. 9(b)

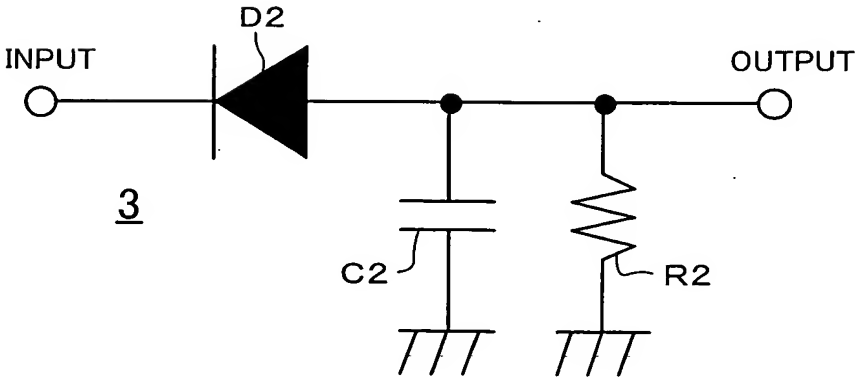


FIG. 10(a)

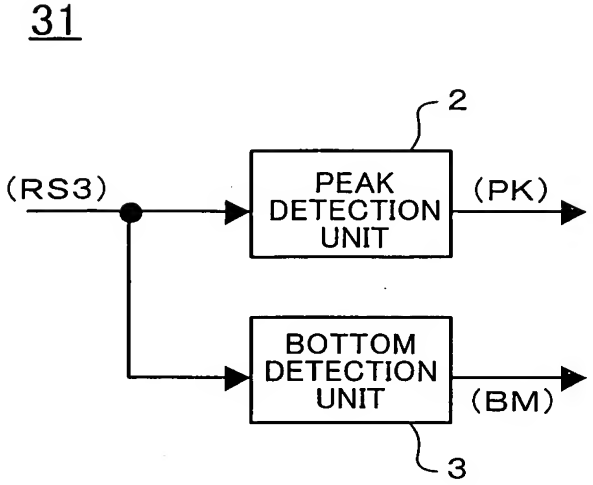


FIG. 10(b)

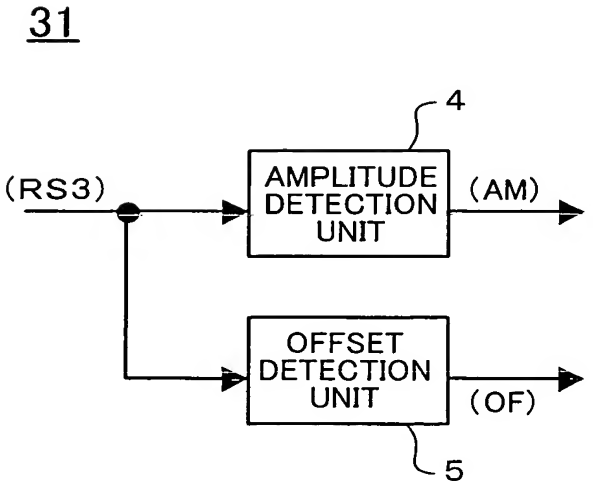


FIG. 11

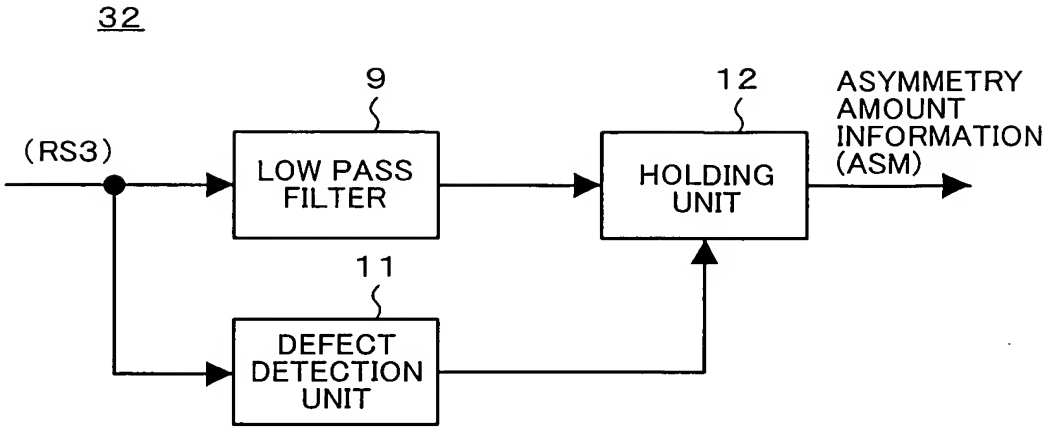

32
9
12
ASYMMETRY AMOUNT INFORMATION (ASM)
(RS3)
LOW PASS FILTER
HOLDING UNIT
11
DEFECT DETECTION UNIT

FIG. 12

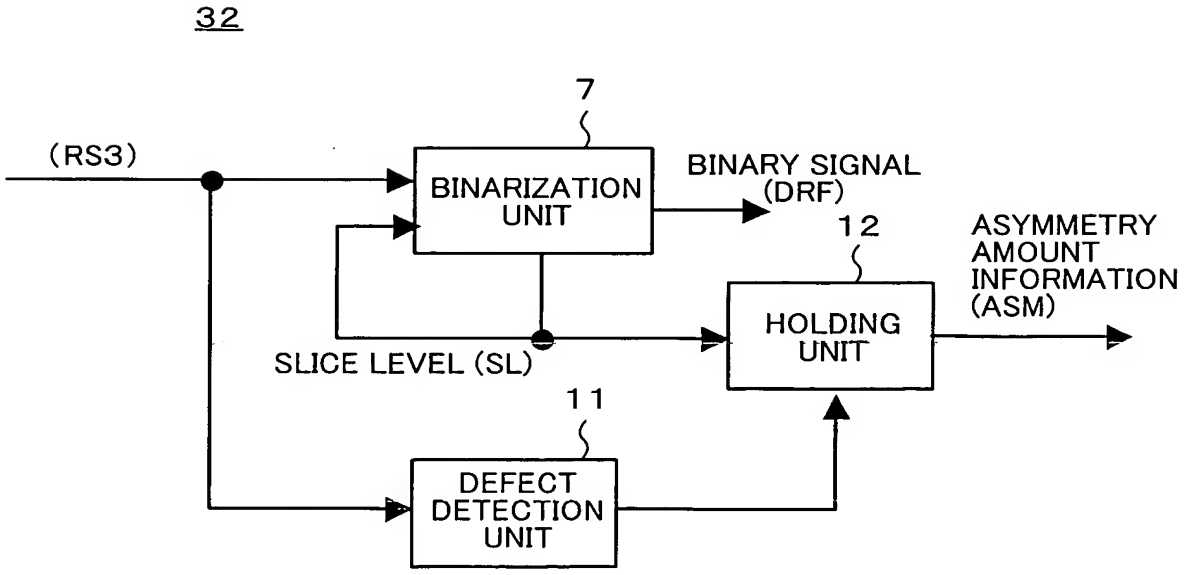

32
7
(RS3)
BINARIZATION UNIT
BINARY SIGNAL (DRF)
12
ASYMMETRY AMOUNT INFORMATION (ASM)
HOLDING UNIT
SLICE LEVEL (SL)
11
DEFECT DETECTION UNIT

FIG. 13

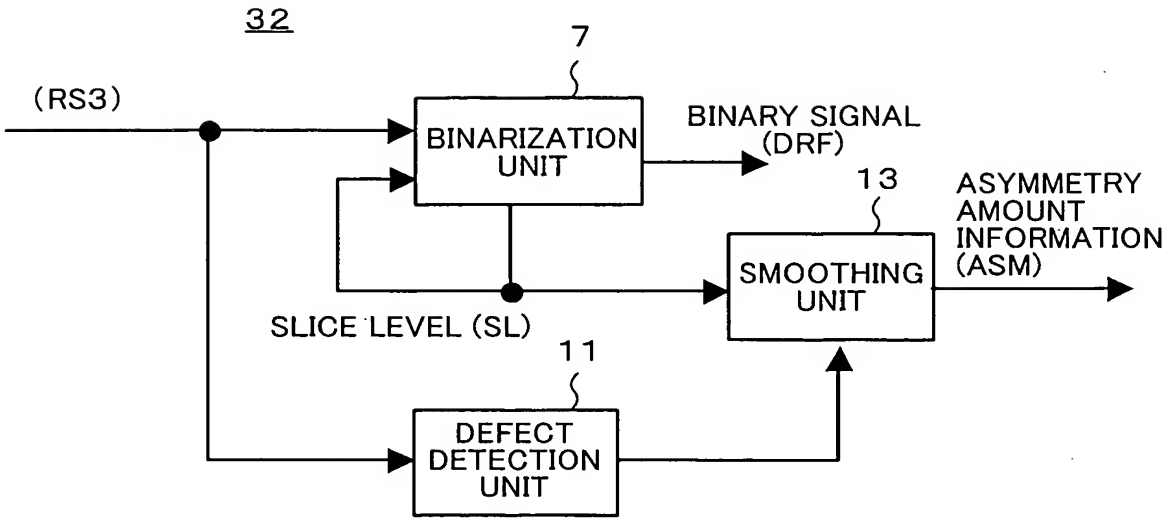

32
7
(RS3)
BINARIZATION UNIT
BINARY SIGNAL (DRF)
13
ASYMMETRY AMOUNT INFORMATION (ASM)
SMOOTHING UNIT
SLICE LEVEL (SL)
11
DEFECT DETECTION UNIT

FIG. 14

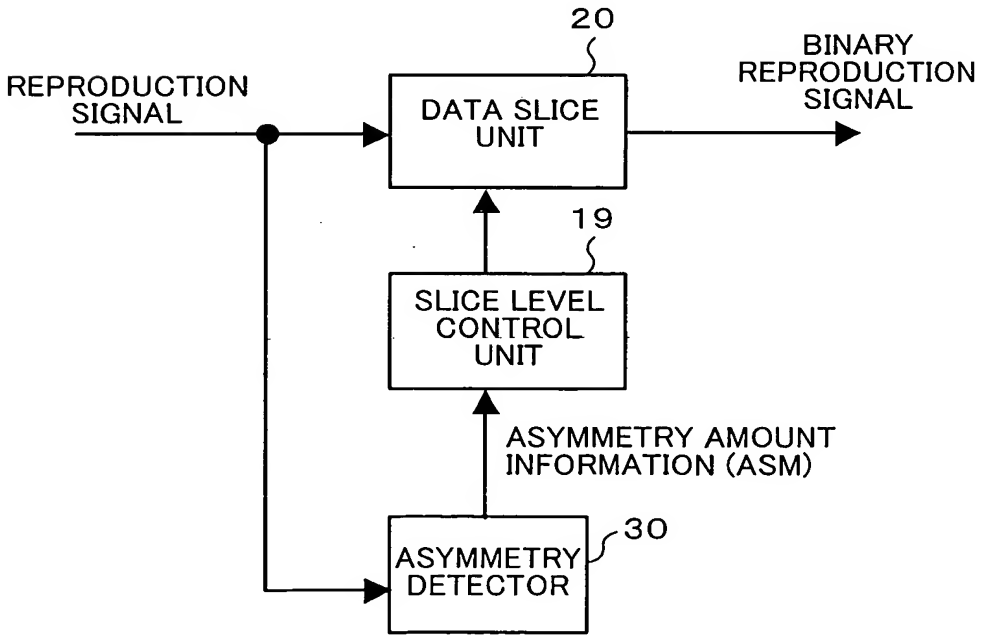

20
REPRODUCTION SIGNAL
DATA SLICE UNIT
BINARY REPRODUCTION SIGNAL
19
SLICE LEVEL CONTROL UNIT
ASYMMETRY AMOUNT INFORMATION (ASM)
30
ASYMMETRY DETECTOR

FIG. 15

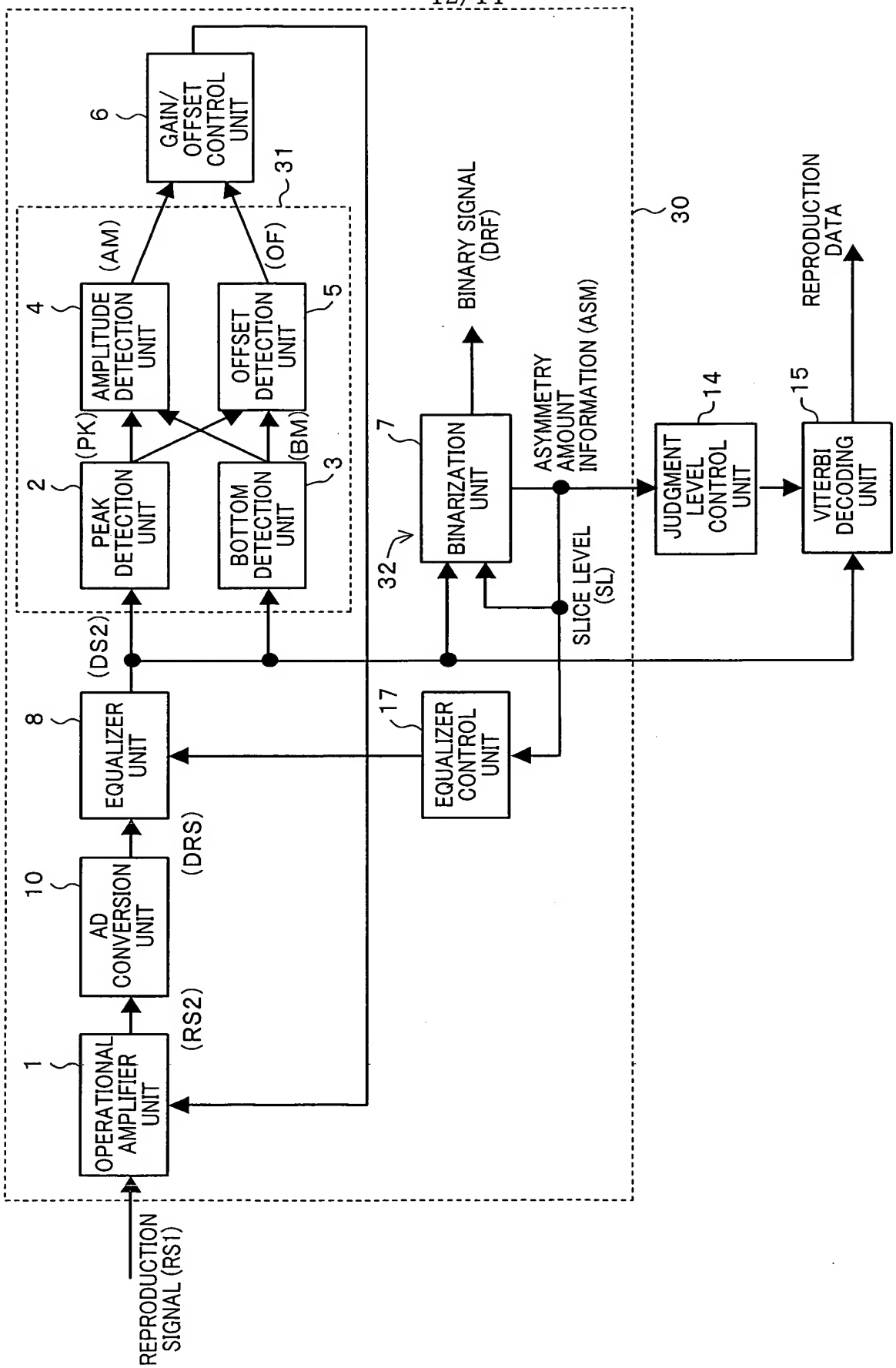

REPRODUCTION SIGNAL (RS1)
OPERATIONAL AMPLIFIER UNIT
1
(RS2)
AD CONVERSION UNIT
10
(DRS)
EQUALIZER UNIT
8
(DS2)
PEAK DETECTION UNIT
2
(PK)
BOTTOM DETECTION UNIT
3
(BM)
AMPLITUDE DETECTION UNIT
4
(AM)
OFFSET DETECTION UNIT
5
(OF)
GAIN/ OFFSET CONTROL UNIT
6
31
30
BINARIZATION UNIT
7
32
BINARY SIGNAL (DRF)
ASYMMETRY AMOUNT INFORMATION (ASM)
SLICE LEVEL (SL)
EQUALIZER CONTROL UNIT
17
JUDGMENT LEVEL CONTROL UNIT
14
VITERBI DECODING UNIT
15
REPRODUCTION DATA

FIG. 16(a)

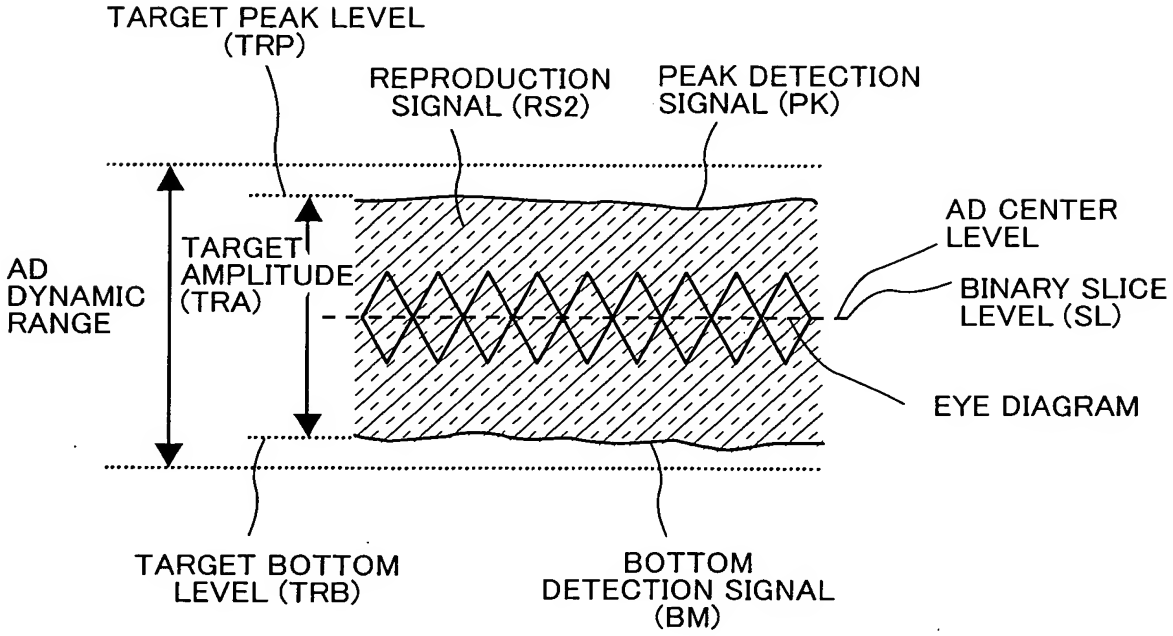


FIG. 16(b)

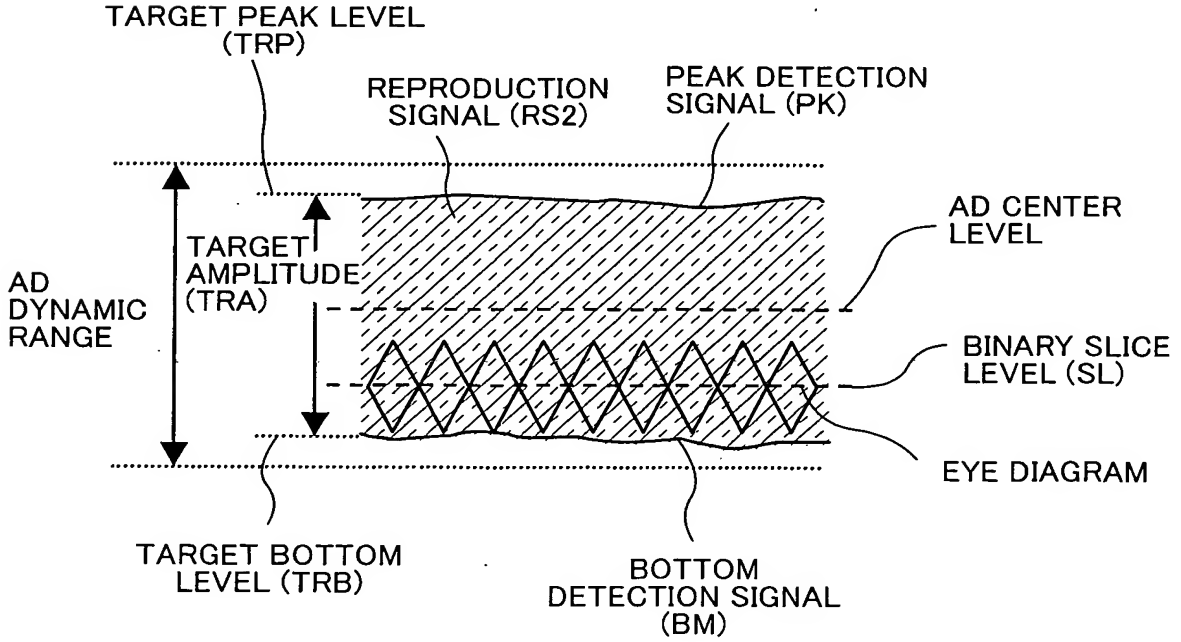
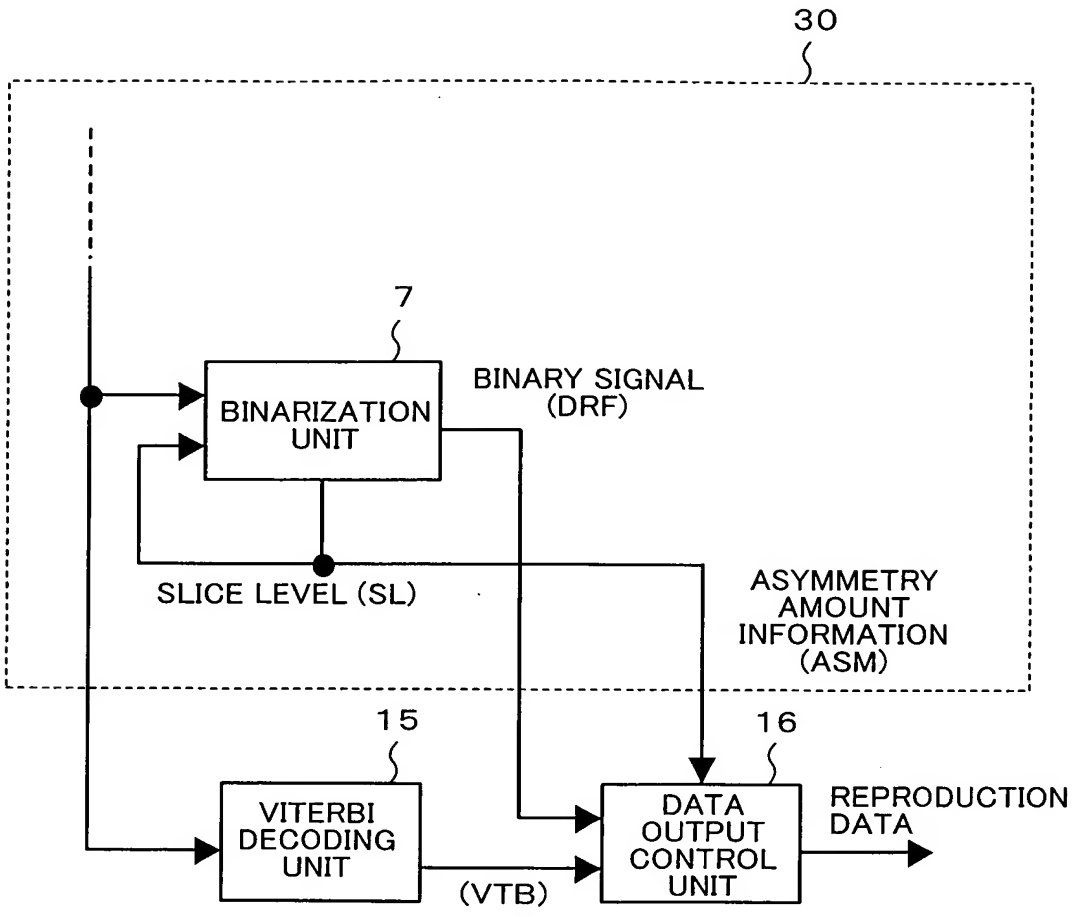


FIG. 17


30
7
BINARIZATION UNIT
BINARY SIGNAL (DRF)
SLICE LEVEL (SL)
ASYMMETRY AMOUNT INFORMATION (ASM)
15
16
VITERBI DECODING UNIT
(VTB)
DATA OUTPUT CONTROL UNIT
REPRODUCTION DATA